SECOND-YEAR OF BACHELOR OF COMPUTER SCIENCE MAJOR REVISED SYLLABUS ACCORDING TO CBCS NEP2020

COURSE TITLE: OPERATING SYSTEMS

SEMESTER-III, W.E.F. 2024-2025

Recommended by the Board of Studies in Computer Science
And
Approved by the Academic Council

Devrukh Shikshan Prasarak Mandal's
Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh.
Tal. Sangameshwar, Dist. Ratnagiri-415804, Maharashtra, India

Academic Council Item No: _____

Name of the Implementing Institute	:	Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh. Tal. Sangameshwar, Dist. Ratnagiri-415804,
Name of the Parent University	:	University of Mumbai
Name of the Programme	:	Bachelor of Science
Name of the Department	:	Computer Science
Name of the Class	:	Second Year
Semester	:	Three
No. of Credits	:	02
Title of the Course	:	Operating System
Course Code	:	S303CST
Name of the Vertical in adherence to NEP 2020	:	Major and Minor
Eligibility for Admission	:	Any 12^{th} Pass seeking Admission to Degree Programme in adherence to Rules and Regulations of the University of Mumbai and Government of Maharashtra
Passing Marks	:	40%
Mode of Assessment	:	Formative and Summative
Level	:	UG
Pattern of Marks Distribution for TE and CIA	:	60:40
Status	:	NEP-CBCS
To be implemented from Academic Year	:	2024-2025
Ordinances /Regulations (if any)		

Syllabus for Second Year of Bachelor of Science in Computer Science

(With effect from the academic year 2024-2025)

SEMESTER-III **Paper No.– 3**

Course Title: Operating System **No. of Credits - 02**

Type of Vertical: Major and Minor **COURSE CODE: S303CST**

Learning Outcomes Based on BLOOM's Taxonomy:

After completing the course, the learner will be able to…		
Course Learning Outcome No.	Blooms Taxonomy	Course Learning Outcome
CLO-01	Understand	To provide a understanding of operating system, its structures and functioning
CLO-02	Analyse	Develop and master understanding of algorithms used by operating systems for various purposes.

Syllabus for Second Year of Bachelor of Science in Computer Science

(With effect from the academic year 2024-2025)

SEMESTER-III **Paper No.– 3**

Course Title: Operating System **No. of Credits - 02**

Type of Vertical: Major and Minor **COURSE CODE: S303CST**

COURSE CONTENT			
Module No.	**Content**	**Credits**	**No. of Lectures**
1	**Introduction and Operating-Systems Structures:** Definition of Operating system, Operating System‟s role, Operating-System Operations, Functions of Operating System, Computing **Environments Operating-System Structures:** Operating-System Services, User and Operating-System Interface, System Calls, Types of System Calls, Operating-System Structure Processes: Process Concept, Process Scheduling, Operations on Processes, **Interprocess Communication Threads:** Overview, Multicore Programming, Multithreading Models **Process Synchronization:** General structure of a typical process, race condition, The Critical-Section Problem, Peterson‟s Solution, Synchronization Hardware, Mutex Locks, Semaphores, Classic Problems of Synchronization, Monitors	01	15
2	**CPU Scheduling:** Basic Concepts, Scheduling Criteria, Scheduling Algorithms (FCFS, SJF, SRTF, Priority, RR, Multilevel Queue Scheduling, Multilevel Feedback Queue Scheduling), Thread Scheduling Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock **Main Memory:** Background, Logical address space, Physical address space, MMU, Swapping, Contiguous Memory Allocation, Segmentation, Paging, Structure of the Page Table Virtual Memory: Background, Demand Paging, Copy-on-Write, Page Replacement, Allocation of Frames, Thrashing **Mass-Storage Structure:** Overview, Disk Structure, Disk Scheduling, Disk Management **File-System Interface:** File Concept, Access Methods,	01	15

	Directory and Disk Structure, File-System Mounting, File Sharing **File-System Implementation:** File-System Structure, FileSystem Implementation, Directory Implementation, Allocation Methods, Free-Space Management		
	Total	**02**	**30**

Required Previous Knowledge

Students should know basic concepts related to computer and computer handling

Access to the Course

The course is available for all the students admitted for Bachelor of Science (Computer Science).

Forms of Assessment

The assessment of the course will be of Diagnostic, Formative and Summative type. At the beginning of the course diagnostic assessment will be carried out. The formative assessment will be used for the Continuous Internal Evaluation whereas the summative assessment will be conducted at the end of the term. The weightage for formative and summative assessment will be 60:40. The detailed pattern is as given below.

Semester End Evaluation (60 Marks)
Question Paper Pattern
Time: 2 hours

Question No.	Unit/s	Question Pattern	Marks
Q.1	I & II	MCQ/Fill in the blanks/One line sentence	20
Q.2	I	Descriptive Questions	20
Q.3	II	Descriptive Questions	20
	Total		**60(converted to 30)**

Internal evaluation (20 Marks)

Sr. No.	Description	Marks
1	Classroom Tests	10
2	Project/ Viva/ Presentations/ Assignments	05
3	Attendance	05
	Total	**20**

Grading Scale

10 points grading scale will be used. The grading scale used is O to F. Grade O is the highest passing grade on the grading scale, and grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.

Reference book:

- Abraham Silberschatz, Peter Galvin, Greg Gagne, Operating System Concepts, Wiley,8th Edition

Text book:

- Techmax publication book

Additional References:

- Achyut S. Godbole, Atul Kahate, Operating Systems, Tata McGraw Hill
- Naresh Chauhan, Principles of Operating Systems, Oxford Press
- Andrew S Tanenbaum, Herbert Bos, Modern Operating Systems, 4e Fourth Edition, Pearson Education, 2016